

**REMARKS**

The Office action dated February 14, 2003 and the cited references have been carefully considered.

**Status of the Claims**

Claims 1-27 are pending. Claims 28-33 are new. Claims 17 and 18 are canceled. Therefore, claims 1-16, 19-33 remain in the current prosecution.

Claims 1, 3, 6, 8, 9, 11, 12, 14, 15, 17, 19, 23, 26, and 27 are objected to because of various informalities.

Claims 17 and 18 are objected to as being substantial duplicates of claims 15 and 16, respectively. Claims 17 and 18 are canceled.

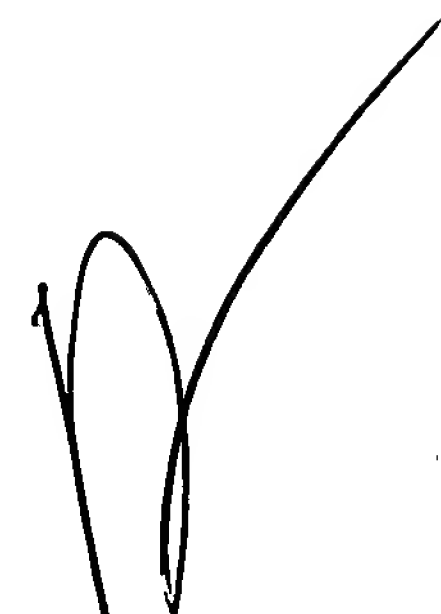
Claims 2, 7, 10, 13, 16, 18, and 20 are rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventors, at the time the application was filed, had possession of the claimed invention.

Claim 27 is rejected under 35 U.S.C. § 112, second paragraph.

Claims 1-3, 9-11, and 21-27 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 10-13 of copending Application No. 09/681,686.

Claims 21 and 22 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 2 of U.S. Patent No. 6,252,254 (Soules et al.; hereinafter called "Soules").

Claims 1-8 and 21-27 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-6 of U.S. Patent 6,501,100 (Srivastava et al.; hereinafter called "Srivastava").



Claims 21 and 22 are rejected under 35 U.S.C. § 102(e) as being anticipated by Soules. Claims 1-8 and 21-27 are rejected under 35 U.S.C. § 102(e) as being anticipated by Srivastava. The Applicants respectfully traverse this rejection for the reasons set forth below.


Claims 12, 15, and 19 would be allowable if rewritten to overcome the objections indicated above. Claims 13, 16, and 20 would be allowable if rewritten to overcome the rejection under 35 U.S.C. § 112, first paragraph, and to include all of the limitations of the base claim and any intervening claims. The Applicants would like to thank the Examiner for indicating that these claims would be allowable. Claim 12 is amended to recite the subscript "a" for (Ca,Sr,Ba). Claims 15 and 19 are amended to recite the proper notation for " $3.5\text{MgO} \cdot 0.5\text{MgF}_2 \cdot \text{GeO}_2 \cdot \text{Mn}^{4+}$ ". Claim 19 also is amended to delete the reference to coactivation with manganese. Therefore, these claims are now in condition for allowance. Claim 13 depends upon claim 12, claim 16 depends upon claim 15, and claim 20 depends upon claim 19. Therefore, these claims are also in condition for allowance. Early allowance of these claims is respectfully requested.

#### **Claim Rejection Under 35 U.S.C. § 112**

Claims 2, 7, 10, 13, 16, 18, and 20 are rejected under 35 U.S.C. § 112, first paragraph, because the specification (Paragraph 0020) teaches an absorption range from about 350 nm to about 400 nm while these claims recite an absorption range from about 350 nm to about 410 nm. Paragraph 00200 is amended to recite a preferred absorption range from about 350 nm to about 410 nm, and is now consistent with and provides support for claims 2, 7, 10, 13, 16, 18, and 20.

Claim 27 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite because it depends on claim 20, which does not recite a light source. Claim 27 is rewritten in independent form to include the limitations of claim 25, which recites a light source, as the Examiner suggested. Therefore, claim 27 now overcomes this rejection.

#### **Provisional Rejections for Double Patenting**



Claims 1-3, 9-11, and 21-27 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 10-13 of copending Application No. 09/681,686.

Since the claims of the copending Application No. 09/681,686 have not been patented, the Applicants respectfully request that the Examiner apply the double patenting rejection to the copending Application No. 09/681,686. Such double patenting rejection will be addressed appropriately when the claims of copending Application No. 09/681,686 are deemed to be allowable.

**Claim Rejection Under the Judicially Created Doctrine of Obviousness-Type Double Patenting**

Claims 21 and 22 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 2 of U.S. Patent No. 6,252,254 to Soules et al.

Soules discloses a phosphor having the formula  $\text{BaMgAl}_{10}\text{O}_{17}:\text{Eu}^{2+},\text{Mn}^{2+}$ . Amended claim 21 (and thus claim 22 also) does not recite this phosphor. And since Soules does not teach or suggest any remaining phosphors recited in claims 21, Soules does not render claims 21 and 22 obvious. Nor is there a double patenting of the claimed subject matter of instant claims 21 and 22.

Claims 1-8 and 21-27 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-6 of U.S. Patent 6,501,100 to Srivastava et al.

Srivastava discloses a two-component phosphor mixture: the first phosphor can be  $\text{Sr}_2\text{P}_2\text{O}_7:\text{Eu}^{2+},\text{Mn}^{2+}$ , and the second phosphor can be  $\text{Sr}_4\text{Al}_{14}\text{O}_{25}:\text{Eu}^{2+}$ . Amended claims 1-8, and 25-27 recite a mixture of at least two phosphors, the second of which is not  $\text{Sr}_4\text{Al}_{14}\text{O}_{25}:\text{Eu}^{2+}$ . Srivastava does not teach the phosphors recited in claims 21-24. Therefore, Srivastava does not render these claims obvious. Nor is there a double patenting of the claimed subject matter of instant claims 1-8 and 21-27.

**Objection to the Drawings**



The Examiner objected to Figure 7 because the term "Ca apatite" is not consistent with the term "Ca halophosphate" used in the specification. Figure 7 is amended and submitted herewith, showing the term "Ca halophosphate," which is used in the specification. Therefore, the objection is now overcome.

**Claim Rejection Under 35 U.S.C. § 102(e)**

Claims 21 and 22 are rejected under 35 U.S.C. § 102(e) as being anticipated by Soules. The Applicants respectfully traverse this rejection because Soules does not teach each and every element of each of claims 21 and 22.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a *single* prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). "The identical invention must be shown in as complete detail as is contained in the . . . claim." *Richardson v. Suzuki Motor Co.*, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989).

Soules does not disclose any of the phosphors recited in each of amended claims 21 and 22. Therefore, Soules does not anticipate these claims.

Claims 1-8 and 21-27 are rejected under 35 U.S.C. § 102(e) as being anticipated by Srivastava.

Srivastava disclose a two-component phosphor mixture: the first phosphor can be  $\text{Sr}_2\text{P}_2\text{O}_7:\text{Eu}^{2+},\text{Mn}^{2+}$ , and the second phosphor can be  $\text{Sr}_4\text{Al}_{14}\text{O}_{25}:\text{Eu}^{2+}$ . Srivastava does not disclose the a phosphor blend comprising at least two phosphors selected from the group consisting of  $\text{Sr}_2\text{P}_2\text{O}_7:\text{Eu}^{2+},\text{Mn}^{2+}$ ;  $(\text{Ca},\text{Sr},\text{Ba})_a(\text{PO}_4)_3(\text{F},\text{Cl},\text{OH}):\text{Eu}^{2+},\text{Mn}^{2+}$  wherein a is in a range from about 4.5 to and including 5;  $3.5\text{MgO}\cdot 0.5\text{MgF}_2\cdot \text{GeO}_2:\text{Mn}^{4+}$ ;  $(\text{Sr},\text{Ba},\text{Ca})_5(\text{PO}_4)_3(\text{Cl},\text{OH}):\text{Eu}^{2+}$ ; an europium-activated aluminate phosphor selected from the group consisting of  $(\text{Ba},\text{Ca},\text{Sr})_2\text{MgAl}_{16}\text{O}_{27}:\text{Eu}^{2+}$ ,  $(\text{Ba},\text{Ca},\text{Sr})\text{MgAl}_{10}\text{O}_{17}:\text{Eu}^{2+}$ , and  $(\text{Ba},\text{Ca},\text{Sr})\text{Mg}_3\text{Al}_{14}\text{O}_{25}:\text{Eu}^{2+}$ ; and an europium and manganese co-activated aluminate phosphor selected from the group consisting of  $(\text{Ba},\text{Ca},\text{Sr})_2\text{MgAl}_{16}\text{O}_{27}:\text{Eu}^{2+},\text{Mn}^{2+}$ ,  $(\text{Ba},\text{Ca},\text{Sr})\text{MgAl}_{10}\text{O}_{17}:\text{Eu}^{2+},\text{Mn}^{2+}$ , and  $(\text{Ba},\text{Ca},\text{Sr})\text{Mg}_3\text{Al}_{14}\text{O}_{25}:\text{Eu}^{2+},\text{Mn}^{2+}$ , as is recited in amended claims 1-5 and 8. In other words, Srivastava's second phosphor can never be the same as the second phosphor of the instant claims.

Srivastava does not disclose at least one phosphor material selected from the group consisting of  $(\text{Ca}, \text{Sr}, \text{Ba})_a(\text{PO}_4)_3(\text{F}, \text{Cl}, \text{OH}):\text{Eu}^{2+}, \text{Mn}^{2+}$  wherein  $a$  is in a range from about 4.5 to and including 5;  $3.5\text{MgO} \cdot 0.5\text{MgF}_2 \cdot \text{GeO}_2:\text{Mn}^{4+}$ ;  $(\text{Sr}, \text{Ba}, \text{Ca})_5(\text{PO}_4)_3(\text{Cl}, \text{OH}):\text{Eu}^{2+}$ ; an europium-activated aluminate phosphor selected from the group consisting of  $(\text{Ba}, \text{Ca}, \text{Sr})_2\text{MgAl}_{16}\text{O}_{27}:\text{Eu}^{2+}$ ,  $(\text{Ba}, \text{Ca}, \text{Sr})\text{MgAl}_{10}\text{O}_{17}:\text{Eu}^{2+}$ , and  $(\text{Ba}, \text{Ca}, \text{Sr})\text{Mg}_3\text{Al}_{14}\text{O}_{25}:\text{Eu}^{2+}$ ; and an europium and manganese co-activated aluminate phosphor selected from the group consisting of  $(\text{Ba}, \text{Ca}, \text{Sr})_2\text{MgAl}_{16}\text{O}_{27}:\text{Eu}^{2+}, \text{Mn}^{2+}$ ,  $(\text{Ba}, \text{Ca}, \text{Sr})\text{MgAl}_{10}\text{O}_{17}:\text{Eu}^{2+}, \text{Mn}^{2+}$ , and  $(\text{Ba}, \text{Ca}, \text{Sr})\text{Mg}_3\text{Al}_{14}\text{O}_{25}:\text{Eu}^{2+}, \text{Mn}^{2+}$ , as is recited in amended claims 21-24 and 32.

Srivastava does not disclose a phosphor blend comprising a mixture of  $\text{Sr}_2\text{P}_2\text{O}_7:\text{Eu}^{2+}, \text{Mn}^{2+}$  and at least one phosphor that is selected from the group consisting of (a)  $(\text{Ca}, \text{Sr}, \text{Ba})_a(\text{PO}_4)_3(\text{F}, \text{Cl}, \text{OH}):\text{Eu}^{2+}, \text{Mn}^{2+}$  wherein  $a$  is in a range from about 4.5 to and including 5 ; (b)  $3.5\text{MgO} \cdot 0.5\text{MgF}_2 \cdot \text{GeO}_2:\text{Mn}^{4+}$ ; (c)  $(\text{Sr}, \text{Ba}, \text{Ca})_5(\text{PO}_4)_3(\text{Cl}, \text{OH}):\text{Eu}^{2+}$ ; (d) an europium activated aluminate phosphor selected from the group consisting of  $(\text{Ba}, \text{Ca}, \text{Sr})_2\text{MgAl}_{16}\text{O}_{27}:\text{Eu}^{2+}$ ,  $(\text{Ba}, \text{Ca}, \text{Sr})\text{MgAl}_{10}\text{O}_{17}:\text{Eu}^{2+}$ , and  $(\text{Ba}, \text{Ca}, \text{Sr})\text{Mg}_3\text{Al}_{14}\text{O}_{25}:\text{Eu}^{2+}$ ; and (e) an europium and manganese co-activated aluminate phosphor selected from the group consisting of  $(\text{Ba}, \text{Ca}, \text{Sr})_2\text{MgAl}_{16}\text{O}_{27}:\text{Eu}^{2+}, \text{Mn}^{2+}$ ,  $(\text{Ba}, \text{Ca}, \text{Sr})\text{MgAl}_{10}\text{O}_{17}:\text{Eu}^{2+}, \text{Mn}^{2+}$ , and  $(\text{Ba}, \text{Ca}, \text{Sr})\text{Mg}_3\text{Al}_{14}\text{O}_{25}:\text{Eu}^{2+}, \text{Mn}^{2+}$ , as is recited in claims 6 and 7.

Srivastava does not disclose a phosphor blend comprising  $(\text{Ca}, \text{Sr}, \text{Ba})_a(\text{PO}_4)_3(\text{F}, \text{Cl}, \text{OH}):\text{Eu}^{2+}, \text{Mn}^{2+}$  wherein  $a$  is in a range from about 4.5 to and including 5, as is recited in claims 9-11 and 30.

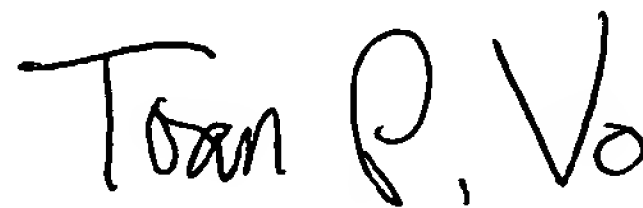
Srivastava does not disclose a phosphor consisting of a material selected from the group consisting of  $\text{Sr}_2\text{P}_2\text{O}_7:\text{Eu}^{2+}, \text{Mn}^{2+}$ ,  $(\text{Ca}, \text{Sr}, \text{Ba})_a(\text{PO}_4)_3(\text{F}, \text{Cl}, \text{OH})\text{Eu}^{2+}, \text{Mn}^{2+}$  wherein  $a$  is in a range from about 4.5 to and including 5, and mixtures thereof, as is recited in claims 25, 26, and 33.

Srivastava does not disclose a phosphor consisting of a first material selected from the group consisting of  $\text{Sr}_2\text{P}_2\text{O}_7:\text{Eu}^{2+}, \text{Mn}^{2+}$  and  $(\text{Ca}, \text{Sr}, \text{Ba})_a(\text{PO}_4)_3(\text{F}, \text{Cl}, \text{OH})\text{Eu}^{2+}, \text{Mn}^{2+}$  wherein  $a$  is in a range from about 4.5 to and including 5; and a second material selected from the group consisting of (a)  $3.5\text{MgO} \cdot 0.5\text{MgF}_2 \cdot \text{GeO}_2:\text{Mn}^{4+}$ ; an europium-activated aluminate phosphor selected from the group consisting of  $(\text{Ba}, \text{Ca}, \text{Sr})_2\text{MgAl}_{16}\text{O}_{27}:\text{Eu}^{2+}, \text{Mn}^{2+}$ ,  $(\text{Ba}, \text{Ca}, \text{Sr})\text{MgAl}_{10}\text{O}_{17}:\text{Eu}^{2+}, \text{Mn}^{2+}$ , and  $(\text{Ba}, \text{Ca}, \text{Sr})\text{Mg}_3\text{Al}_{14}\text{O}_{25}:\text{Eu}^{2+}, \text{Mn}^{2+}$ ; and (c) an europium and manganese co-activated aluminate phosphor selected from the group consisting of

(Ba,Ca,Sr)<sub>2</sub>MgAl<sub>16</sub>O<sub>27</sub>:Eu<sup>2+</sup>, Mn<sup>2+</sup>, (Ba,Ca,Sr)MgAl<sub>10</sub>O<sub>17</sub>:Eu<sup>2+</sup>, Mn<sup>2+</sup>, and (Ba,Ca,Sr)Mg<sub>3</sub>Al<sub>14</sub>O<sub>25</sub>:Eu<sup>2+</sup>, Mn<sup>2+</sup>, as is recited in claim 27. (Please note that amended claim 27 is rewritten to incorporate the limitations of claim 25, as filed. Therefore, amended claim 27 finds support in the original specification as filed.)

In view of the above, it is submitted that the claims are patentable and in condition for allowance. Reconsideration of the rejection is requested. Allowance of claims at an early date is solicited.

Respectfully submitted,



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